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PATI & BRILL, LLC ONE NORTH LASALLE STREET 44TH FLOOR CHICAGO, IL 60602			SOUW, BERNARD E	
			ART UNIT	PAPER NUMBER
			2881	

DATE MAILED: 10/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/082,720

Applicant(s)

DUNN ET AL.

Examiner

Bernard E. Souw

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 26 February 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 02/26/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. Receipt is acknowledged of information disclosure statement (IDS) submitted on 02/26/2002. The submission is in compliance with the provisions of 37 CFR 1.97.

A signed copy of the information disclosure statement is here enclosed.

2. The listing of references in the specification is not a proper information disclosure statement. Specifically, the article by D. Wineland and C. Monroe in the journal Nature, January 2000, cited in the specification sect.[0005] is not listed in the 02/26/2202 IDS. Neither is a copy of this NPL literature submitted along with the Application. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

### ***Objection to the Specification***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. The specification is objected to under 35 U.S.C. 112, first paragraph, as failing to provide an adequate written description of the invention and as failing to adequately teach how to make and/or use the invention, i.e. failing to provide an enabling disclosure.

There is no reputable evidence of record to support any allegations or claims that the invention is capable of an improvement in the communication arts achieved by providing a method of communicating comprising the steps of creating from a signal, waves/particles at a source at a spaced relationship from a destination; detecting the waves/particles at the destination; and interpreting the effects of the waves/particles to provide a reconstruction of the signal for use at the destination, at which the momentum of the waves/particles ... moved .... at speeds greater than the-speed-of-light-in-a-vacuum, as recited in sect.[0007].

There is no reputable evidence of record to support any allegations or claims that the invention is capable of an improvement in the communication arts achieved by providing a translator that translates signals into waves/particles; an emitter that transmits the waves/particles from a source to a destination at a spaced relationship from the source location; a receiver that receives the waves/particles at the destination; a detector that detects the waves/particles at the destination, an interpreter at the destination that interprets effects of the waves/particles allowing a reconstruction of the signals for use at the destination, wherein momentum is carried from the source to the destination by the waves/particles emitted and this momentum communicates the translated signal from the source to the destination at a speed that is greater than the-

speed-of-light-in-a-vacuum (hereinafter denoted as "c") for at least part of the path, as recited in sect. [0008].

Therefore applicant's invention is considered to be nothing more than a speculation.

Referring in particular to applicant's disclosure the following exemplary discrepancies, inconsistencies, allegations, etc. are noted in regard to the operability/enableness of the alleged "communication at a speed greater than c" in the proposed communication method and system:

(a) There is neither adequate description nor enabling disclosure of a specific operative embodiment of the invention required for one of ordinary skill in the art to make and/or use the invention. It is noted that the specification appears to set information for some of the parameters (see, e.g., sect [0016]), reciting "*a media-less quantum telegraph system*" by means of "quons", the latter further described as "*any entity no matter how immense that may or may not be phase entangled that exhibits both wave and particle aspects in a peculiar quantum manner*". However, there is no adequate description nor enabling disclosure of specific parameters of a specific operative embodiment of the invention, including exact material and method(s) of making/constructing a "*quantum telegraph*" system; nor is such a "*quantum telegraph*" system known in the art. Specifically, the "quons" intended to be used by Applicant is more or less a hypothetical entity having esoteric and exotic character (**see Appendix VII**). Furthermore, what is meant with an "entity that may or may not be phase entangled" not only is indefinite due to the wording "may and may not", but also obscure

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due to the vague meaning of the word "phase entangled". In this regard, by referring to Wineland and Monroe, Applicant seems to hint a vague correlation with the well-known Quantum Entanglement effect. However, a quantum entangled system as known in the art (Wineland & Monroe et al., see PTO-892) is distinctively different than a phase entangled system recited by Applicant, since --as known in the art-- it is definitely not the phase of the particle's wave function (but instead, its state), which is entangled in a quantum entangled system. Thus Applicant's recitation of "phase entangled entity" fails to teach any prospective user as to how to make Applicant's invention.

It is to be noted, Applicant's citation of Wineland & Monroe in sect.[0005] is deemed indefinite (no journal number, date and page number, inadequate citation of authors). A thorough search made by the Examiner to find all publications written by Wineland & Monroe resulted in an article that includes many more authors, as listed in the attached PTO-892, i.e., "*Decoherence of quantum superpositions through coupling to engineered reservoirs*", by Myatt, King, Turchette, Sackett, Kielpinski, Hano, Monroe and Wineland, appearing in NATURE, Vol.403, January 2000, pp.269-273. However, the article does not confirm what Applicant has claimed, i.e., an experimental proof for superluminal (or instant) communication by utilizing the phase-entanglement or quantum-entanglement effect. Instead, the article is about the decoherence of a quantum-entangled system of particles, which has nothing to do with the phase of a particle or system at any time, as claimed by Applicant in sect.[0016], but instead, specifically with a decoherence of the particle's entangled state. There is a fundamental difference between a phase of a particle (wave function) as meant by

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Applicant, which is continuously changing with time, and the state of the particle as meant by Applicant's prior art, which is preserved and does not change with time, especially if the states are entangled. Moreover, the phase of the particle wave function is not a measurable quantity, since it vanishes if the particle position is measured, i.e., by virtue of the complex conjugate product  $|\psi|^2$ , in which the phase simply disappears. This makes an additional rejection based on 35 U.S.C. 101 (see later).

However, and most importantly, the cited Wineland & Monroe's paper obviously does not provide such enablement. It is thus impossible that Applicant's reliance on that cited paper would ever provide any enablement.

As a matter of fact, although quantum entanglement is theoretically possible, nobody has so far succeeded to utilize the effect to transmit a useful signal between a transmitter and receiver pair, simply because any effort to send a useful signal would inevitably cause a breakdown of the quantum entanglement (Shih & Kim, Optics Comm. 179 (2000) 357-359, see Fig.5 and relevant text; theoretical analysis by G. Hunter <[http://arxiv.org/PS\\_cache/quant-ph/pdf/0507/0507009.pdf](http://arxiv.org/PS_cache/quant-ph/pdf/0507/0507009.pdf)>). 35 U.S.C. 112, first paragraph requires the applicant itself to inform, not to direct others to find out for themselves, how to make the invention; *In re Gardner et al*, 166 U.S.P.Q. 138, *In re Scarbrough*, 182 U.S.P.Q. 298. Note that the disclosure must enable a person skilled in the art to practice the invention without having to design structure not shown to be readily available in the art; *In re Hirsch*, 131 U.S.P.Q. 198.

Thus, as set forth above, **applicant has not set forth an enabling disclosure.**

(b) Another embodiment described in sect. [0021] and sect.[0026] relies on an article on "*gain-assisted linear anomalous dispersion superluminal light propagation*" that "*allows photons to be propagated at greater than the speed of light in a vacuum on its path to detector*", using a cesium cell pumped by lasers, as reported by Wang et al. (*Nature*, Vol.406, 20 July 2000, pp.277-279), and cited by Applicant in sect.[0004].

However, there is no reputable evidence of record to support any allegations or claims that the "*superluminal*" effect observed by Applicant's prior art (Wang et al.) is capable of transporting communications signals at speeds faster than  $c$ , as claimed by Applicant. In the contrary, in direct reference to the cited prior art in *Nature*, the authors (Wang et al.) made a contradicting statement in "Frequently Asked Questions" <<http://www.neci.nj.nec.com/homepage/lwan/faq.htm>>, which specifically recites "*Information coded using a light pulse **cannot be transmitted faster than  $c$  using this effect**. Hence, it is **still true** to say that "Information carried by a light pulse **cannot be transmitted faster than  $c$** ."* This statement obviously contradicts Applicant's claimed invention. Thus, the invention must have been based on a mistaken interpretation of Applicant's own prior art.

35 U.S.C. 112, first paragraph requires the applicant itself to inform, not to direct others to find out for themselves, how to make the invention; *In re Gardner et al*, 166 U.S.P.Q. 138, *In re Scarbrough*, 182 U.S.P.Q. 298. Note that the disclosure must enable a person skilled in the art to practice the invention without having to design structure not shown to be readily available in the art; *In re Hirsch*, 131 U.S.P.Q. 198.

Thus, as set forth above, **applicant has not set forth an enabling disclosure**.



(c) There is no adequate description nor enabling disclosure of how and in what manner, one can produce the "*peculiar*" material named "*quons*" for use in the "*media-less quantum telegraph system*". Furthermore, it is unclear as to what exactly and how peculiar is meant by "*peculiar*". As matter of fact, a "quon" is more or less an exotic entity appearing in esoteric aether theory (see **Appendix VII**). Nobody knows how to make "quons", or even explains what it actually is.

Again, as set forth above, **applicant has not set forth an enabling disclosure.**

(d) Another feature (embodiment?) of the invention, i.e., ***bifurcated array of entopic time-synchronized exciters***", appears only, and for the first time, in claims 3 and 4, but nowhere in the specification. Therefore, the term is not enabling either, besides it is a New Matter not described in the specification.

(e) A direct experimental refutation of the claimed invention is provided by Brunner et al. at <<http://nocr.qp.epfl.ch/webdav/site/nccr.qp/users/148101/private/Ggisin2.pdf>>, "*Direct Measurement of Superluminal Group Velocity and Signal Velocity in an Optical Fiber*" in which a bifurcated fiberoptic line is used, wherein the signal is split into two polarization modes, i.e.,  $|H\rangle$  (horizontal) and  $|V\rangle$  (vertical) modes, by means of a birefringent fiber, as recited on pg.1/col.2/lines 17-21. The result is depicted in Brunner's Fig.4a, showing that, although the group velocity of the pulse is greater than  $c$ , the leading edge of the pulse arriving at the receiver is truncated, as expressly stated in lines 5-7, "*the pulse is distorted in such a way that its front travels with a constant speed, the signal velocity  $c/n_f$ .*" More specifically, Brunner et al. recite on

pg.3/col.2/lines 12-16, *"In fact, even though the group velocity is higher for each successive curve, the signal velocity remains constant and equal to  $c/n_r$ , since the **front parts of all pulses are strictly identical**".*

It is apparent from the specification that applicant's concept is merely a hand-waving speculation based on a mistaken interpretation of some references found in the open literature, i.e., Wineland and Monroe (not confirmed) and Wang et al.. Note, (a-e) are only examples of the discrepancies, inconsistencies, allegations, etc. associated with the operability/enableness of applicant's invention. Discrepancies (a-e) are not intended to encompass every discrepancies, inconsistencies, allegations, etc. associated with applicant's inventions.

As set forth in (a-e) above, the examiner has presented evidence showing that Applicant's claimed invention is nothing else than a hand-waving speculation based on an incorrect interpretation of some articles found in the open literature. There is no evidence to indicate applicant has so succeeded where others have failed, in arriving at an operative communications system based on quantum entanglement effect or gain-assisted "superluminal" effect in cesium vapor, i.e. that he has progressed his system beyond the point of an unproven theory or concept which still requires an undue amount of experimentation to enable the artisan to make and use the inventive system for its indicated purpose. This view is also considered supported by the failure to set forth a full example of the specific parameters of an operative embodiment. One cannot rely on the skill in the art for the selection of the proper quantitative values to present an operative superluminal communications system, since those in the art do not know what

these values would be. See *Bank v. Rauland Corp.*, 64 U.S.P.Q. 93., *In re Corneil et al*, 145 U.S.P.Q. 697.

To reiterate briefly, the examiner has presented evidence that Applicant's superluminal communications system based on phase entanglement or quantum entanglement and/or gain-assisted superluminal effect in cesium vapor, is a mere speculation based on misunderstanding of the reference literature, cannot reasonably be expected to be reproducible or even obtainable with the present invention. There is no reputable evidence of record that would overcome the experimental showings of Brunner et al. disproving any true superluminal effect. Again, there is no evidence to indicate applicant has so succeeded where others have failed, in arriving at an operative system that is capable of delivering communications signal at speeds greater than  $c$ , i.e., that he has progressed his system beyond the point of an unproven theory of concept which still requires an undue amount of experimentation to enable the artisan to make and use the invention for its indicated purpose.

In consequence, it is thus considered that the examiner has set forth a reasonable and sufficient basis for challenging the adequacy of the disclosure. The statute requires the applicant itself to inform, not to direct others to find out for themselves; *In re Gardner et al*, 166 U.S.P.Q. 138, *In re Scarbrough*, 182 U.S.P.Q. 298. Note that the disclosure must enable a person skilled in the art to practice the invention without having to design structure not shown to be readily available in the art; *In re Hirsch*, 131 U.S.P.Q. 198.

***Claim Rejections - 35 USC §101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 1-17 are rejected under 35 U.S.C. 101 because the claimed invention as disclosed is inoperative and therefore lacks utility.

(a) The reasons that the inventions as disclosed is inoperative are the same as the reasons set forth in section 3 above as to why the specification is objected to, and accordingly, the reasons set forth in section 3 (a-e) above are incorporated herein.

Most relevant to the present 35 U.S.C. 101 rejection, the disclosure recites in sect [0016] “a media-less quantum telegraph system” by means of “quons”, the latter further described as “any entity no matter how immense that may or may not be phase entangled that exhibits both wave and particle aspects in a peculiar quantum manner”. By further referring to Wineland and Monroe, Applicant seems to hint a vague correlation with the quantum entanglement effect well known in the art (see, e.g., Shih & Kim 2000 and G. Hunter 2005 listed in PTO-892). A separate search made by the examiner results in an article by Myatt, King, Turchette, Sackett, Kielpinski, Hano, Monroe and Wineland, titled “Decoherence of quantum superpositions through coupling to engineered reservoirs”, appearing in NATURE, Vol.403, January 2000, pp.269-273. If this is the same as what is cited by Applicant in sect.[0005], then the examiner sees a big problem in accepting this as a support for Applicant’s invention: (a) The article is about decoherence measurement of a quantum-entangled system of particles, and has

nothing to do with the phase of a particle or system at any time, as claimed by Applicant in sect.[0016], but instead, specifically with a decoherence of the particle's entangled state. There is a fundamental difference between a phase of a particle (wave function) as meant by Applicant, which is a quantity continuously varying in time, and the state of the particle as meant by Applicant's prior art, which is preserved and does not change in time, especially if the states are entangled. Moreover, the phase of the particle wave function is not a measurable quantity, since it vanishes if the particle position is measured, i.e., by virtue of the complex conjugate product  $|\psi|^2$  in which the phase simply disappears.

Note, for the applied objections/rejections under 35 U.S.C. §101 and §112/¶.1 presented in this Office Action, references are used/cited regardless of their publication date (MPEP §2107.02/IV/IV; see **Appendix V**).

(b) Most importantly, it is also determined that the claimed invention as disclosed is inoperative and therefore lacks utility, specifically because of applicant's (mis)use of the word "faster than the speed of light in vacuum", e.g., in the abstract and in sect.[0004]/lines 16-17; in sect.[0006]/lines 3-4; in sect.[0021]/line 7); or "superluminal", e.g., in sect. [0021]/line4-5; and etc., throughout the entire disclosure, including the claims.

Usually Applicant is allowed to be his own lexicographer, and may want to mean with the word "superluminal" or "faster than the speed of light in vacuum" something different than the usually accepted meaning. However, such a difference is not defined by Applicant in the specification. Therefore, the words of the claim must be given their

plain meaning, "*unless applicant has provided a clear definition in the specification*". [MPEP §2111.01; *In re Zletz*, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989); *MSM Investments Co. v. Carolwood Corp.*, 259 F.3d1335, 1339-40, 59 USPQ2d 1856, 1859-60 (Fed. Cir. 2001)].

By taking the word "superluminal" and "faster than the speed of light in vacuum" as their accepted meaning, it is known in the art that the invention would not work as the inventor(s) claims it would, or, in other words, the invention is deemed *inoperative* (MPEP § 2107.01/II, see **Appendix I**). An invention that is "*inoperative*" (i.e., it does not operate to produce the results claimed by the patent applicant) is not a "*useful*" invention in the meaning of the patent law. See, e.g., *Newman v. Quigg*, 877 F.2d 1575, 1581, 11 USPQ2d 1340, 1345 (Fed. Cir. 1989); *In re Harwood*, 390 F.2d 985, 989, 156 USPQ 673, 676 (CCPA 1968) ("*An inoperative invention, of course, does not satisfy the requirement of 35 U.S.C. 101 that an invention be useful.*").

Any "faster than the speed of light in vacuum" or "superluminal" signal propagation not only is an obvious violation of natural law (Einstein's Special Theory of Relativity), but also a violation of the human logic, i.e., the causality principle (see **Appendix VI**). In consequence, the disclosed invention lacks a well-established utility as well as a specific asserted utility.

Special relativity prohibits superluminal velocity NOT only for particles with mass, but also for mass-less particles, such as photons. As a matter of fact, Special Relativity states that any two events that are space-like, regardless of their mass, cannot be inter-related by causality (**Appendix VI**). Einstein's causality principle states that no object

can travel at superluminal speed, since otherwise one skilled in the art would be able to observe from another frame of reference that is related to the first frame by a Lorentz transformation (all inertial frames interrelated by Lorentz transformations are equal and undistinguishable with respect to the laws of physics), in which the time sequence of the event is reversed, and hence, no causality could thereby be involved. Note: Fitzpatrick's lecture quoted in the **Appendix VI** is free from any mass in the condition for Einstein's causality. The causality condition is thus valid for both mass-less particles (photons) as well as particles with mass.

This §101 rejection of the claims 1-17 based on inoperative and incredible invention (*see MPEP cited in Appendix I*) is directly related to the §112/¶.1 objection of the disclosure imposed in a previous section of this Office Action.

Therefore, unless Applicant is able to bring forward a convincing evidence that a speed faster than the speed of light in vacuum is factually achieved in Applicant's invention (*see MPEP cited in Appendix II, III, IV*), Applicant's use of the term "superluminal" and/or "faster than the speed of light in vacuum", has no factual basis, and hence, must be deemed incredible and inoperative. This examiner's requirement for a convincing evidence is closely related to the ultimate requirement imposed in section 8 (see below) for a hard evidence according to MPEP § 2107.02IV, i.e., a working prototype of communication device capable of transmitting useful signals at speeds greater than c.

(c) There is no reputable evidence of record to indicate the invention has been reduced to the point of providing in current available form, i.e., an operative communications system capable of transmitting information at speeds faster than c.

For all these reasons, the invention is not considered as meeting the requirements of 35 U.S.C. 101 as being "*useful*". The applicant --at best-- has set forth what may be considered a concept or an object of scientific research. However, it has been held that such does not present a utility within the meaning of 35 U.S.C. 101. See *Brenner v. Manson*, 148 U.S.P.Q. 689.

(d) Additionally, it is well established that where as here, the utility of the claimed invention is based upon allegations that border on the incredible or allegations that would not be readily accepted by a substantial portion of the scientific community, sufficient substantiating evidence of operability must be submitted by applicant. (MPEP §2107.02/V; see Appendix). Note also *In re Houghton*, 167 U.S.P.Q. 687 (CCPA 1970); *In re Ferens*, 163 U.S.P.Q. 609 (CCPA 1969); *In re Puharich v. Brenner*, 162 U.S.P.Q. 136 (CA DC 1969); *In re Pottier*, 152 U.S.P.Q. 407 (CCPA 1967); *In re Ruskin*, 148 U.S.P.Q. 221 (CCPA 1966); *In re Citron*, 139 U.S.P.Q. 516 (CCPA 1963); and *In re Novak*, 134 U.S.P.Q. 335 (CCPA 1962).

### ***Claim Rejections - 35 USC §112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make



and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1-17 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The reasons that the inventions as disclosed are not enabling are the same as the reasons set forth in section 3 above as to why the specification is objected to, and the reasons set forth in section 3 (a-e) above are accordingly incorporated herein.

As set forth in sections 3, 4 and 5 above, the examiner has established a *prima facie* showing that Applicant's claimed invention is inoperative for violating known law(s) of nature (relativity theory) as well as human logic (principle of causality), and therefore lacks utility (35 U.S.C. §101), in addition to being based on a non-enabling disclosure (35 U.S.C. §112/¶.1). According to MPEP §2164.07II/C (see **Appendix III**), the burden now shifts to the applicant to rebut the *prima facie* showing. *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). See also *In re Brana*, 51 F.3d 1560, 34 USPQ2d 1436 (Fed. Cir.1995) (citing *In re Bundy*, 642 F.2d 430, 433, 209 USPQ 48, 51 (CCPA 1981))".

6. Claims 1 and 14, and consequently also claims 2-13 and 15-17 dependent thereof, are rejected under 35 U.S.C. 112/¶.1 because the claimed invention is not supported by either a specific asserted utility or a well-established utility.

Claims 1 and 14 recites the limitation "momentum of the waves/particles to travel ... at a speed that is greater than the speed of light in a vacuum". As already recited in the previous objection of the disclosure under §112/¶.1 and the preceding rejection of claims 1-17 under §101, the cited claim limitation does not conform with the known laws of nature and is also inconsistent with any known scientific principle, thus also "factually misleading". The court held that when an "*alleged utility appears to be incredible in the light of the knowledge of the art, or factually misleading, applicant must establish the asserted utility by acceptable proof.*" *In re Citron*, 325 F.2d 248, 253, 139 USPQ 516, 520 (CCPA 1963); *In re Sichert*, 566 F.2d 1154, 196 USPQ 209 (CCPA 1977) (MPEP §2107.02IV; **see Appendix II**).

For reasons described below, claims 1 and 14 are found inconsistent with known scientific principle, thus also "factually misleading", and hence must be deemed ***incredible*** in the light of knowledge in the art:

In case of particles, it is known in the art that any mass would increase to infinity if it moves with a speed that is greater than the speed of light in a vacuum. A particle's momentum is defined as a product of its mass and its velocity. Consequently, no particle momentum can travel with a speed that is greater than the speed of light in a vacuum, as claimed in claims 1 and 14.

In case that lightwave is meant by Applicant, it is known that no lightwave can travel with a speed that is greater than the speed of light in a vacuum. This is a fundamental law of nature, as manifested in Einstein's Special Theory of Relativity, as

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well as the universal principle of causality, as described in Appendix VI (Fitzpatrick's Lecture).

A direct experimental refutation of the claimed invention is given by Brunner et al. at <<http://nocr.qp.epfl.ch/webdav/site/nccr.qp/users/148101/private/Ggin2.pdf>>, "*Direct Measurement of Superluminal Group Velocity and Signal Velocity in an Optical Fiber*" in which a *bifurcated array of entopic time-synchronized exciters* similar to Schmitz's bifurcated fiberoptic line is used, wherein the signal is split into two polarization modes, i.e.,  $|H\rangle$  (horizontal) and  $|V\rangle$  (vertical) modes by means of a birefringent fiber, as recited on pg.1/col.2/lines 17-21. The result is shown in Brunner's Fig.4a, in which it is expressly stated in lines 5-7, "*the pulse is distorted in such a way that its front travels with a constant speed, the signal velocity  $c/n_f$ .*" More specifically, Brunner et al. recite on pg.3/col.2/lines 12-16, "*In fact, even though the group velocity is higher for each successive curve, the signal velocity remains constant and equal to  $c/n_f$ , since the **front parts of all pulses are strictly identical***". Brunner's result also agrees with Steinberg & Chiao and Mitchell & Chiao cited below, as well as with a great number of references found in the open literature in relation to "superluminal velocity".

Obviously, Brunner's result directly refutes Applicant's claim of "momentum of the waves/particles to travel .... at a speed that is greater than the speed of light in a vacuum". This forms a basis for all the §101 and §112/¶.1 rejections presented in this Office Action.

As set forth in above, the examiner has established a *prima facie* showing that Applicant's claimed invention is inoperative for violating known law(s) of nature

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(relativity theory) as well as human logic (principle of causality). As such, claims 1 and 14, and consequently also claims 2-13 and 15-17, are based on an incredible invention that is factually also misleading. Consequently, claims 1 and 14, and consequently also claims 2-13 and 15-17, are not supported by either a specific asserted utility or a well-established utility. *In re Citron*, 325 F.2d 248, 253, 139 USPQ 516, 520 (CCPA 1963); *In re Sichert*, 566 F.2d 1154, 196 USPQ 209 (CCPA 1977) (MPEP §2107.02/V; **see Appendix II**).

7. Claims 11-13 and 15-17 are rejected under 35 U.S.C. 112/¶.1 because the claimed invention is not supported by either a specific asserted utility or a well established utility.

Claims 11-13 (dependent on claim 1) and 15-17 (dependent on claim 14) recite the limitation of using a "*gain-assisted linear anomalous dispersion superluminal light propagation cell*" to implement the limitation of claim 1, i.e., to cause the "*momentum of the waves/particles to travel .... at a speed that is greater than the speed of light in a vacuum*".

In this regard Applicant's cited prior art, Wang et al. (***Nature***, Vol.406, 20 July 2000, pp.277-279), is invalid as a support, since the authors evidently have based their conclusions either on a (mis)use of the terminology "superluminal" different than its accepted meaning, or, on a scientifically incorrect interpretation of the measurements made by the authors. Evidence for a (mis)use of the terminology "*superluminal*" is self-obvious in the author's (self-)contradictory statement made in "Frequently Asked

Questions" <<http://www.neci.nj.nec.com/homepage/lwan/faq.htm>>, specifically reciting (self-contradiction highlighted/underlined) "*Information coded using a light pulse **cannot** be transmitted faster than  $c$  **using this effect**. Hence, it is **still true** to say that <<Information carried by a light pulse **cannot** be transmitted faster than  $c$ .>> The detailed reasons are very complex and are still under **debate**." Such a debate is not at all needed, since one of ordinary skill in the art already knows, what is claimed by Applicant and his cited reference authors is simply incorrect, for violating known laws of nature (Einstein's Special Relativity) and the principle of causality, as described previously.*

Evidence for an incorrect interpretation of the experimental result is given by (a) Brunner et al., as recited previously; (b) Steinberg & Chiao (Phys. Rev. 49 (3), 1994, 2071-2075), hereinafter addressed as Steinberg'94, as recited on pg. 2075/col.2/lines 16-18, regarding the amplification of the leading edge at the expense of the trailing edge; and (c) Mitchell & Chiao (Am. J. Phys. 66, 1998, 14-19), hereinafter denoted as Mitchell'98, as recited on pg.17/col.1/lines 15-35, specifically regarding "*amplification of the early part and attenuation of the middle and late parts*" (lines 17-18).

Furthermore, Applicant's cited reference (Wang et al.) has deliberately misinterpreted their own measurement results as shown in Fig.4 on page 4 of the cited reference. If one takes account of the author's own experimental data given on page 3, lines 6-8 from bottom, i.e., that the "advanced" pulse has in fact a transmitted intensity of only 40%, one of ordinary skill in the art immediately sees that the latter is just a pulse distortion, i.e., amplification of the leading edge followed by attenuation of the

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trailing edge under quasi preservation of the pulse shape, in full agreement with the references (a),(b), (c) previously cited by the examiner. Thus, Fig.4 shown in the reference's page 4, with all the conclusion drawn by the authors, is based on a manipulated data that is scientifically unjustified. Therefore, Applicant's main reference, Wang et al., is deemed **invalid** as support for Applicant's invention.

Applicant's second reference, Wineland & Monroe, cannot be properly evaluated, since Applicant failed to submit along with other references listed in the IDS. An independent search made by the examiner results in an article by Myatt, King, Turchette, Sackett, Kielpinski, Hano, Monroe and Wineland, titled "*Decoherence of quantum superpositions through coupling to engineered reservoirs*", appearing in NATURE, Vol.403, January 2000, pp.269-273. If this is the same as what is cited by Applicant in sect.[0005], then the examiner sees a big problem in accepting this as a support for Applicant's invention: (a) The article is about decoherence measurement of a quantum-entangled system of particles, and has nothing to do with the phase of a particle or system at any time, as claimed by Applicant in sect.[0016], but instead, specifically with a decoherence of the particle's entangled state. There is a fundamental difference between a phase of a particle (wave function) as meant by Applicant, which is a quantity variable in time, and the state of the particle as meant by Applicant's prior art, which does not change in time, especially if the states are entangled. Moreover, the phase of the particle wave function is not a measurable quantity, since it vanishes if the particle position is measured, i.e., by virtue of the

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complex conjugate product  $|\psi|^2$  in which the phase simply disappears. This makes an additional rejection based on 35 U.S.C. 101 (see above).

As set forth in above, the examiner has established a *prima facie* showing that Applicant's claimed invention is inoperative for violating known law(s) of nature (relativity theory) as well as human logic (principle of causality). As such, 11-13 and 15-17 are based on an incredible invention that is factually also misleading. Consequently, claims 11-13 and 15-17 are not supported by either a specific asserted utility or a well-established utility. *In re Citron*, 325 F.2d 248, 253, 139 USPQ 516, 520 (CCPA 1963); *In re Sichert*, 566 F.2d 1154, 196 USPQ 209 (CCPA 1977) (MPEP §2107.02/V; **see Appendix II**).

8. In view of the previously imposed § 112/¶.1 and § 101 according to MPEP § 2107.02/V (**Appendix I**), and primarily in consequence of the serious violations of physics law and human logic, an additional proof of hard evidence is requested by the Examiner according to MPEP § 2107.02/V (**Appendix IV**), i.e., specifically, a working prototype of communication device capable of transmitting useful signals at speeds greater than c.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 3, 4, and 6-8 are also rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "**bifurcated array of entopic time-synchronized exciters**" appears only, and for the first time, as limitation in claims 3 and 4, but is nowhere to be found in the specification.

To proceed with this examination, the term "**bifurcate**" is interpreted by the examiner as its usual/conventional meaning, i.e., "*to (cause to) divide into two branches or parts*", as defined in Merriam Webster's Collegiate Dictionary, 10<sup>th</sup> edition, Merriam-Webster Inc., Springfield, MA, 1993, pg. 111.

Further. The term entopic is interpreted as "*in the usual place*", as defined in the website Encyclopaedia Wikipedia, <<http://en.wikipedia.org/wiki/Entopic>>.

In agreement with these two definitions, the term "**bifurcated array of entopic time-synchronized exciters**" is thus interpreted by the examiner as being similar (but not necessarily equal) to the bifurcated fiberoptic lines described in the article "*A fast versatile instrument for dynamic optical tomography*" by C.H. Schmitz et al., as recited in section 3, Sensor Head Design, line 8 and line 14, available from the website:

<<http://nocr.qp.epfl.ch/webdav/site/nccr.qpo/users/1248101/private/Gisin2.pdf>>

Another form of examiner's free interpretation of Applicant's indefinite wording "**bifurcated array of entopic time-synchronized exciters**" is the pair of transmitter and receiver slits used in an experiment on quantum entanglement performed by Shih & Kim (2000) and explained by G. Hunter (2005). See PTO-892.



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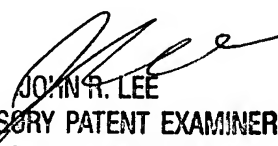
### ***Communications***

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard E Souw whose telephone number is 571 272 2482. The examiner can normally be reached on Monday thru Friday, 9:00 am to 5:00 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 571 272 2477. The central fax phone number for the organization where this application or proceeding is assigned is 571 273 8300 for regular communications as well as for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571 272 5993.

bes  
September 21, 2005

  
JOHN R. LEE  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800

## **APPENDICES**

### **Appendix I:**

#### **MPEP § 2107.01:**

#### **II. WHOLLY INOPERATIVE INVENTIONS; "INCREDIBLE" UTILITY**

An invention that is "inoperative" (i.e., it does not operate to produce the results claimed by the patent applicant) is not a "*useful*" invention in the meaning of the patent

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law. See, e.g., *Newman v. Quigg*, 877 F.2d 1575, 1581, 11 USPQ2d 1340, 1345 (Fed. Cir. 1989); *In re Harwood*, 390 F.2d 985, 989, 156 USPQ 673, 676 (CCPA 1968) (“*An inoperative invention, of course, does not satisfy the requirement of 35 U.S.C. 101 that an invention be useful.*”).

In many of these cases, the utility asserted by the applicant was thought to be “*incredible in the light of the knowledge of the art, or factually misleading*” when initially considered by the Office. *In re Citron*, 325 F.2d 248, 253, 139 USPQ 516, 520 (CCPA 1963). Other cases suggest that on initial evaluation, the Office considered the asserted utility to be inconsistent with known scientific principles or “*speculative at best*” as to whether attributes of the invention necessary to impart the asserted utility were actually present in the invention. *In re Sichert*, 566 F.2d 1154, 196 USPQ 209 (CCPA 1977). However cast, the underlying finding by the court in these cases was that, based on the factual record of the case, it was clear that the invention could not and did not work as the inventor claimed it did.

## **Appendix II:**

### **MPEP §2107.02/V:**

In appropriate situations the Office may require an applicant to substantiate an asserted utility for a claimed invention. See *In re Pottier*, 376 F.2d 328, 330, 153 USPQ 407, 408 (CCPA 1967) (“*When the operativeness of any process would be deemed unlikely by one of ordinary skill in the art, it is not improper for the examiner to call for evidence of operativeness.*”). See also *In re Jolles*, 628 F.2d 1322, 1327, 206 USPQ 885, 890 (CCPA 1980); *In re Citron*, 325 F.2d 248, 139 USPQ 516 (CCPA 1963); *In re Novak*, 306 F.2d 924, 928, 134 USPQ 335, 337 (CCPA 1962). The court held that when an “*alleged utility appears to be incredible in the light of the knowledge of the art, or factually misleading, applicant must establish the asserted utility by acceptable proof.*” *In re Citron*, 325 F.2d at 253, 139 USPQ at 520.

### **Appendix III:**

#### **MPEP §2164.07//C**

If a rejection under 35 U.S.C. 101 has been properly imposed, along with a corresponding rejection under 35 U.S.C. 112, first paragraph, the burden shifts to the applicant to rebut the prima facie showing. *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). See also *In re Brana*, 51 F.3d 1560, 34 USPQ2d 1436 (Fed. Cir. 1995) (citing *In re Bundy*, 642 F.2d 430, 433, 209 USPQ 48, 51 (CCPA 1981))”.

### **Appendix IV:**

#### **MPEP §2107.02/V** (underlines added by the examiner):

Requests for additional evidence should be imposed rarely, and only if necessary to support the scientific credibility of the asserted utility (e.g., if the asserted utility is not consistent with the evidence of record and current scientific knowledge). As the Federal Circuit recently noted, “[o]nly after the PTO provides evidence showing that one of ordinary skill in the art would reasonably doubt the asserted utility does the burden shift to the applicant to provide rebuttal evidence sufficient to convince such a person of the invention’s asserted utility.” *In re Brana*, 51 F.3d 1560, 34 USPQ2d 1436 (Fed. Cir. 1995) (citing *In re Bundy*, 642 F.2d 430, 433, 209 USPQ 48, 51 (CCPA 1981)).

### **Appendix V:**

#### **MPEP §2107.02/IV/IV** (underlines added by the examiner):

The prima facie showing must be set forth in a well-reasoned statement. Any rejection based on lack of utility should include a detailed explanation why the claimed invention has no specific and substantial credible utility. Whenever possible, the examiner should provide documentary evidence regardless of publication date (e.g., scientific or technical journals, excerpts from treatises or books, or U.S. or foreign patents) to support the factual basis for the prima facie showing of no specific and substantial

credible utility. If documentary evidence is not available, the examiner should specifically explain the scientific basis for his or her factual conclusions.

## **Appendix VI:**

### ***R. Fitzpatrick's 1996 Lecture at the Texas University***

copied from a Website of the Texas University (R. Kirkpatrick 1996 lecture),  
<< <http://farside.ph.utexas.edu/teaching/jk1/relativity.pdf> >>,  
Section 2, Relativity and electromagnetism, Subsection 2.3, Transformation of velocities

#### **Summary by the examiner:**

The Lorentz transformation implies, that, not only the velocities of material particles, but also the velocities of propagation of all physical effects are limited by  $c$  in deterministic physics. Consider a general process by which an event  $P$  causes an event  $Q$  at a velocity  $U > c$  in some frame  $S$ . In other words, *information* about the event  $P$  appears to propagate to the event  $Q$  with a superluminal velocity. Let us choose coordinates such that these two events occur on the  $x$ -axis with (finite) time and distance separations  $\Delta t > 0$  and  $\Delta x > 0$ , respectively. The time separation in some other inertial frame  $S'$  is given by (see Eq. (2.19d) of Fitzpatrick's 1996 lecture attached to PTO-892)

$$\Delta t' = \gamma (\Delta t - v \Delta x / c^2) = \gamma \Delta t (1 - v U / c^2)$$

where  $\gamma$  is defined as  $\gamma = (1 - v^2/c^2)^{-1/2}$ . Thus, for sufficiently large  $v < c$  we obtain  $\Delta t' < 0$ . In other words, there exist inertial frames in which cause and effect appear to be reversed. Of course, this is impossible in deterministic physics. It follows, therefore, that information can never appear to propagate with a superluminal velocity in any inertial frame; otherwise causality would be violated (underlines added by the examiner).

## **Appendix VII:**

### **[a] The Quon — Hadronic Aether**

<http://www.reference.com/browse/wiki/Aether>

The first cogent model of a dynamic Aether was proposed by H. Aspden as far back as 1958. Aspden's model of a dynamic Aether invokes the existence of a near-balanced continuum of cosmological charge populated by 'Aether particles', the **quons**, that are capable of condensing ordinary electron-positron pairs and are not subject to the constraints of Relativity (hence, are massless-like). Aspden's theory has also been called a model of the hadronic Aether because the proposed Aether lattices also contain positively charged mu-mesons and massive gravitons and supergravitons.

## [b] TUTORIAL NOTE 7

### ***AETHER DYNAMICS - by Harold Aspden, 1997***

<http://www.energyscience.org.uk/tu/tu07.htm>

I regard this particle system as being the structured array which accounts for the 'crystal' form of the **aether** in the analogy with its 'fluid crystal' attributes. I regard the particles of this structured array as being those **quons** I mentioned in Tutorial No. 6. **Quons** all have the same electrical polarity in any local region of space and so they repel one another to form into a simple cubic array. Unlike the situation in solid matter, where atoms bond together as if attracted to one another and so form compact structures, such as body-centered cubic or face-centered cubic lattice-like systems, the **aether** adopts the simple cubic structure. This makes our calculation task easier.